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COMPLETE SPECIFICATION.

Improvements in Door Controlling Apparatus.

I, HOZUMI KITA, a subject of the Emperor of Japan, of 7, Atano, Aza, Kitago-mura, Sunto-gori, Shizuoka Prefecture, Japan, do hereby declare the nature of this invention and in what manner the same is to be performed to be particularly described and ascertained in and by the following statement:—

This invention relates to electrically operated locks or fastening devices for doors, and provides for an efficient door controlling apparatus and an alarm system particularly applicable to an audible burglar alarm system.

According to this invention an exciting circuit is formed by connecting an exciting coil of a solenoid in the electrically operated lock, the exciting coil of an electro-magnetic switch, a hand operated switch, and any suitable electric supply source in series, together with a bell circuit closed by the said electro-magnetic switch, a cut off circuit including operative means to open the said bell circuit, and a minute vibration switch connected in parallel with the circuit containing the solenoid coil for the operation of the lock.

The accompanying drawing shows a diagram for the door controlling apparatus according to the present invention.

A is any suitable electrically operated lock fitted in a door. B is an exciting circuit connecting an exciting coil *a* wound around the electro-magnet which acts upon the lock A, a switch button C, an electro-magnetic switch *b* and a battery or any other electric source *d* in series. An electric bell circuit C¹ closed by the electro-magnetic switch *b*, and a cut off circuit D which acts to open the said bell circuit, are connected in parallel to the exciting circuit. A minute vibration switch E, that is a switch operated by minute vibration, comprising a carbon member *f* arranged between contact pieces *e* and *e*¹, is connected in parallel to the circuit B, and the electro-magnetic switch *b* is caused to operate by variation of contact resistance between the carbon member *f* and contact pieces *e*, *e*¹. The electro-magnetic switch *b* or cut off switch consists of an electro-magnet *g* or *h* respectively. *i* is an iron

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piece or armature which is attracted by the electro-magnet *g* or *h* when it is excited. The minute vibration switch E is preferably arranged in or near the door.

In the apparatus according to this invention, the switch C is opened while the door is to be secured in the shut position, as shown in the drawing, but when the contact pieces *e*, *e*¹ and carbon member *f* are contacted by applying vibration, the electro-magnet *g* is excited to attract the armature *i*. At this moment, as the said armature contacts with terminals *j* and *j*¹ in the electro-magnetic switch *b*, the bell circuit will be closed so as to ring the bell *k*. The ringing of the bell will continue till the cut off circuit is closed by a switch *l* and the armature *i* is pulled back by the electro-magnet *h* to disconnect it from the terminals *j* and *j*¹.

I am aware that in specification No. 14607 of 1908 it has been proposed to provide a door locking apparatus to be employed with a series of railway carriage doors, in which the closing of all the doors completes a circuit to release the engine starting mechanism and simultaneously to close a bell circuit which includes solenoids for actuating the bolts of the door locks. Opening of the main circuit when the train is in motion causes an auxiliary circuit to be closed, in which circuit an audible warning device is arranged.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. An electrically operated lock or fastening device for doors, in which an exciting circuit is formed by connecting an exciting coil of a solenoid in the electrically operated lock, the exciting coil of an electro-magnetic switch, a hand operated switch, and any suitable electric supply source in series, together with a bell circuit closed by the said electro-magnetic switch, a cut off circuit including operative means to open the said bell circuit, and a minute vibration switch connected in parallel with the circuit containing the solenoid coil for the operation of the said lock.

2. An electrically operated lock or fastening device for doors, in which an exciting circuit is formed by connecting an exciting coil of a solenoid in the electrically operated lock, an exciting coil of an electro-magnetic switch, a hand operated switch preferably arranged outside the lock casing, and any suitable electric supply source, all arranged in series, together with a bell circuit to be closed by an armature attracted by exciting the electro-magnet of the said electro-magnetic switch, a cut off circuit comprising an electro-magnet which acts to pull back the said armature so as to open the bell circuit, in which apparatus the said bell circuit the cut-off circuit and the minute vibration switch are connected in parallel with the said exciting circuit containing the solenoid coil for the operation of the said lock.
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Dated this 10th day of April 1928.

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Agents for the Applicant.

[This Drawing is a reproduction of the Original on a reduced scale.]

